REMARKS

Favorable reconsideration and allowance of the claims of the present application, as amended, are respectfully requested.

Before addressing the specific grounds of rejection raised in the present Office Action, applicants have amended Claim 15 to positively recite that the nitride liner *extends into the semiconductor substrate that surrounds the at least one trench isolation region*. Support for this amendment to Claim 15 is found throughout the specification of the instant application. See particularly, paragraphs [0024] and [0052]. Applicants observe that plasma nitridation is used in forming the inventive nitride liner rather than CVD or PECVD. In such prior art deposition processes, the nitride liner would be present only within the exposed walls of the trench. CVD or PECVD do not result in a nitride liner having the claimed properties, i.e., extending into the semiconductor substrate that surrounds the at least one trench isolation region.

Since the above amendment to Claim 15 does not introduce new matter to the specification of the instant application, entry thereof is respectfully requested.

In the present Office Action, Claims 15, 16 and 18-20 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 6,348,394 to Mandelman, et al. ("Mandelman, et al."). Claim 17 stands rejected under 35 U.S.C. § 103 as allegedly obvious over the combined disclosures of Mandelman, et al. and U.S. Patent Application Publication No. 2004/0155275 A1 to Divakaruni, et al. ("Divakaruni, et al.").

Concerning the § 102(b) rejection, it is axiomatic that anticipation under § 102 requires that the prior art reference disclose each and every element of the claim to which

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it is applied. In re King, 801 F.2d, 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1996). Thus, there must be no differences between the subject matter of the claim and the disclosure of the prior art reference. Stated another way, the reference must contain within its four corners adequate direction to practice the invention as claimed. The corollary of the rule is equally applicable: Absence from the applied reference of any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Applicants submit that the claims of the present application are not anticipated by the disclosure of Mandelman, et al. since the applied reference does not disclose applicant's claimed structure including the features present in amended Claim 15. Specifically, Mandelman, et al. do not disclose a semiconductor structure which includes a nitride liner present at least on sidewalls of a trench isolation region that is located within a semiconductor substrate, said nitride liner extends into the semiconductor substrate that surrounds the at least one trench isolation region and protects the sidewalls of the at least one trench isolation region so as to reduce stress in the semiconductor substrate.

Mandelman, et al. provide a semiconductor structure including a trench isolation region that includes a thin oxide liner 15 and a nitride liner 16 formed within the trench. As described in Mandelman, et al., the thin oxide is contact with the semiconductor substrate within the trench and the nitride liner 16 is located atop the oxide liner 15. Applicants observe that in FIG. 3 the oxide liner 15 shown in FIG. 2, which is the structure formed prior to FIG 3, was omitted.

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Applicants further observe that even if the oxide liner 15 is not needed in Mandelman, et al., the applied reference does not disclose that the nitride liner extends into the semiconductor substrate that surrounds the at least one trench isolation region, which feature is presently claimed. Applicants submit that in Mandelman, et al. (See, Col. 3, lines 10-11) CVD is used in forming the nitride liner and, as such, the nitride liner 16 would not extend into the semiconductor substrate that surrounds the at least one trench isolation region. Applicants respectfully submit that in the claimed invention the nitride liner is prepared by a plasma nitridation process which causes the nitride liner to extend into the semiconductor substrate that surrounds the at least one trench isolation region.

The foregoing remarks clearly demonstrate that the applied reference does not teach each and every aspect of the claimed invention, as required by King and Kloster Speedsteel; therefore the claims of the present application are not anticipated by the disclosure of Mandelman, et al. Applicants respectfully submit that the instant § 102 rejection has been obviated and withdrawal thereof is respectfully requested.

With regard to the obviousness rejection citing the combined disclosures of Mandelman, et al. and Divakurani, et al., applicants respectfully submit that the combined disclosures do not teach or suggest applicants' claimed structure recited in amended Claim 15. Specifically, Mandelman, et al. and Divakurani, et al. do not teach or suggest a semiconductor structure which includes the claimed nitride liner which is present on at least the sidewalls of the at least one trench isolation and extends into the semiconductor substrate that surrounds the at least one trench isolation region.

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Mandelman, et al. are defective for the same reasons as discussed above under the anticipation rejection and as such those remarks are incorporated herein by reference. To reiterate: Mandelman, et al. do not teach or suggest forming the nitride liner directly on a semiconductor substrate within a trench isolation region and that the nitride liner extends into the semiconductor substrate that surrounds that at least one trench isolation region.

Divakurani, et al. do not alleviate the above defect in Mandelman, et al. Specifically, Divakurani, et al. do not teach or suggest applicants' claimed nitride liner which is present at least one the sidewalls of the trench isolation region and extends into the semiconductor substrate that surrounds the trench isolation region. Applicants observe that in prior art FIG. 2A, a nitride liner 50 is shown on the sidewalls of the trench. The nitride liner 50 is said to be deposited (see paragraph [0038]) in a trench recess. Applicants observe that Divakurani, et al. do not teach or suggest which deposition processes are used in forming nitride liner 50 and, as such, one skilled in the art would consider that a conventional deposition process such as CVD or PECVD was used in forming that liner. In the claimed invention, a plasma nitridation process is used in forming a nitride liner that is located at least on the sidewalls of the trench isolation region and extends into the semiconductor substrate that surrounds the trench isolation region. No such nitride liner is taught or suggested by in the disclosure of Divakurani, et al.

As such, the combined disclosures of Mandelman, et al. and Divakurani, et al. do not render the claimed structure obvious.

The § 103 rejection also fails because there is no motivation in the applied references which suggest modifying the disclosed structure to include the nitride liner

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having the features presently recited in the claims of the present invention. Thus, there is no motivation provided in the applied references, or otherwise of record, to make the modification mentioned above. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Vaeck, 947 F.2d, 488, 493, 20 USPQ 2d. 1438, 1442 (Fed.Cir. 1991).

The rejection under 35 U.S.C. § 103 has been obviated; therefore reconsideration and withdrawal thereof is respectfully requested.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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